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(54) **URINARY CATHETER**

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(51) **Int. Cl.**

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See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,373,009	A	2/1983	Winn
4,487,808	A	12/1984	Lambert
4,616,064	A	10/1986	Zukosky et al.
4,906,237	A	3/1990	Johansson et al.
5,356,709	A	10/1994	Woo et al.

(Continued)

FOREIGN PATENT DOCUMENTS

EP	0 496 305	A2	1/1992
EP	0 669 142	A2	8/1995

(Continued)

OTHER PUBLICATIONS

Chart, Shore a Hardness vs. Shore D hardness, http://www.calce.umd.edu/TSFA/Hardness_ad_.htm, Fig. 5, p. 10.

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(57) **ABSTRACT**

A medical device is disclosed, comprising a substrate, having on its surface, on at least a part thereof, a hydrophilic surface layer providing low-friction surface character of the medical device when wetted by a wetting fluid. The substrate is made of a polymer blend comprising a polyolefin and a composition having molecules with active hydrogen(s), such as polyamide or polyurethane. The hydrophilic surface layer is preferably adhered to the substrate by a polyurea network, whereby said polyurea network forms a covalent bond to said active hydrogen(s) in the substrate. The new substrate material is environmentally acceptable and cost effective, has adequate mechanical and chemical properties and enables the hydrophilic coating to be adequately adhered.

21 Claims, 1 Drawing Sheet